

SECTION 702 BITUMINOUS MATERIALS

702.01 BITUMINOUS MATERIALS. Furnish bituminous materials meeting the requirements of the following tables. The MDT tables are located at the end of this section.

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|--|-----------------------|
| (1) Asphalt Cement | 702-3 |
| (2) Rapid Curing Liquid Asphalt(RC) | 702-4 |
| (3) Medium Curing Liquid Asphalt(MC) | 702-5 |
| (4) Slow Curing Liquid Asphalt(SC) | 702-6 |
| (5) High Float Emulsions | 702-7 |
| (6) Emulsified Asphalt | AASHTO M 140, Table 1 |
| | AASHTO M 208, Table 1 |

Meet the requirements for bituminous materials specified in the Contract.

702.02 TESTING AND ACCEPTANCE.

- A. All Properties Except Asphalt Cement Penetration.** Bituminous materials are accepted on the test results of samples selected and tested by the Department or its authorized representative. Collect samples as specified in Subsection 402.03.2 and tested using the applicable AASHTO method. The Project Manager may permit using bituminous materials before the test results are available, if the test results of material previously furnished by the refiner have consistently been satisfactory. Bituminous materials used before receipt of the test results and permitted by the Project Manager does not waive the Department's right to accept or reject materials under these specifications.
- B. Asphalt Cement Penetration.** Asphalt cement penetration is sampled and accepted under Subsections 402.03.2 and 402.03.5(B).

TABLE 702-1

BASIS FOR ACCEPTANCE OF BITUMINOUS MATERIALS					
SAMPLE TESTED	SPECIFICATION LIMITS ¹		TOLERANCE LIMITS ²		REMARKS
	Test Results Within Limits	Test Results Outside Limits	Test Results Within Limits	Test Results ³ Outside Limits	
Original Sample	Accept Material	Apply Tolerance Limits ²	Accept Material	Test Retained Sample	Retained sample will be tested only if test results of original sample are outside tolerance limits.
Retained Sample	Accept Material	Apply Tolerance Limits ²	Accept Material	Accept Material at Reduced Price or Reject	

¹ - See specification for bituminous materials.

- ² - Tolerance limits are applied to the minimum and maximum specification values of specification tables. See Table 702-2 for Schedule of Tolerances.
- ³ - Do not retain a second sample for bituminous sample accepted under Q.A. Pay adjustments will be applied under Q.A.

If test results of both the original and retained samples are not within the tolerance limits, the average of the two values will determine the basis for acceptance of the material.

Exception: If either of the two test values are outside the applicable ASTM Repeatability Range, then the test value numerically nearest the specification requirement will be used as the basis for acceptance. In the event a material fails more than one test requirement, that requirement with the greatest violation will determine the basis for acceptance. See Subsection 402.03.5© for the method of calculating price reductions.

**TABLE 702-2
SCHEDULE OF TOLERANCES**

ALLOWABLE VARIATION			
TEST	From Min. Specification Requirement	From Max. Specification Requirement	REMARKS
Flash Test Asphalt Cement Cutback Asphalt	-5% -10%		
Penetration Liquid Asphalt Distillation Residues	-10%	+10%	
% Residue from Distillation	5%		% of Total Distillate: 2 ml may be added or subtracted at any distillation temp. before calculating the % recovered
Ductility	-10%		
Solubility	-0.5%		
Viscosity Cutback Asphalts Emulsified Asphalts	-10% 0%	+10% +25%	Emulsified asphalt in violation of the minimum specification requirement subject to rejection and removal from the work or 50% price reduction at the Engineer's discretion.
% Residue of 100 Pen.	-5%		
Thin Film Oven Test % loss in wt. % retained Pen.	-2%	+10%	
Demulsibility and Sieve Tests	-10%	+10%	
Spot Test	NO TOLERANCE - Materials in violation of spec. subject to standard price reduction.		
Water	NO TOLERANCE - Materials in violation of spec. subject to rejection or 50% price reduction at the Engineer's discretion.		
Particle Charge	NO TOLERANCE - Materials in violation of spec. and any aggregate used in conjunction with its use will, at the Engineer's discretion, be either rejected or paid for at a unit rate not to exceed 50% of the cost of the materials.		

**TABLE 702-3
SPECIFICATION FOR ASPHALT CEMENT**

	40-50		60-70		Penetration Grade 85-100		120-150		200-300	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Penetration at 25°C (77°F) 100 g. 5 sec.	40	50	60	70	85	100	120	150	200	300
Flash point, Cleveland Open Cup	450	—	450	—	450	—	425	—	350	—
Ductility at 25°C (77°F) 5 cm. per min., cm	100	—	100	—	100	—	100	—	—	—
Solubility	99	—	99	—	99	—	99	—	99	—
Thin-film oven test, 1/8 in. (3.2 mm), 163°C (325°F) 5 hour loss on heating, percent	—	0.8	—	0.8	—	1.0	—	1.3	—	1.5
Penetration of residue percent of original	58	—	54	—	50	—	46	—	40	—
Ductility of residue at 25°C (77°F) 5 cm. per min., cm.	—	—	50	—	75	—	100	—	100	—
Spot test	Negative for all grades									

**TABLE 702-4
SPECIFICATIONS FOR RAPID CURING LIQUID ASPHALTS**

	RC-70		RC-250		RC-800		RC-3000	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Kinematic Viscosity at 60°C (140°F) (See Note 1) centistokes	70	140	250	500	800	1600	3000	6000
Flash point (Tag, open-cup), degrees C (F)	—	—	27 (80)	—	27 (80)	—	27 (80)	—
Water, percent	—	0.2	—	0.2	—	0.2	—	0.2
Distillation test: Distillate, percentage by volume of total distillate to 360°C (680°F)								
to 190°C (374°F)	10	—	—	—	—	—	—	—
to 225°C (437°F)	50	—	35	—	15	—	—	—
to 260°C (500°F)	70	—	60	—	45	—	25	—
to 315°C (600°F)	85	—	80	—	75	—	70	—
Residue from distillation to 360°C (680°F) volume percentage of sample by difference	55	—	65	—	75	—	80	—
Tests on residue from distillation:								
Penetration, 100 g., 5 sec. at 25°C (77°F)	80	120	80	120	80	120	80	120
Ductility, 5 cm./min. at 25°C (77°F) cm.	100	—	100	—	100	—	100	—
Solubility	99	—	99	—	99	—	99	—

Note 1. As an alternate, Saybolt-Furol viscosities may be specified as follows:

Grade RC-70 - Furol viscosity at 50°C (122°F) - 60 to 120 sec.

Grade RC-250 - Furol viscosity at 60°C (140°F) - 125 to 250 sec.

Grade RC-800 - Furol viscosity at 82.2°C (180°F) - 100 to 200 sec.

Grade RC-3000 - Furol viscosity at 82.2°C (180°F) - 300 to 600 sec.

TABLE 702-5
SPECIFICATION FOR MEDIUM CURING LIQUID ASPHALTS

	MC-30		MC-70		MC-250		MC-800		MC-3000	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Kinematic Viscosity at 60°C (140°F) (See Note 1) centistokes	30	60	70	140	250	500	800	1600	3000	6000
Flash point (Tag, open-cup), degrees C (F)	38 (100)	—	38 (100)	—	66 (150)	—	66 (150)	—	66 (150)	—
Water, percent	—	0.2	—	0.2	—	0.2	—	0.2	—	0.2
Distillation test: Distillate, percentage by volume of total distillate to 360°C (680°F) to 225°C (437°F) to 260°C (500°F) to 315°C (600°F)	— 40 75	25 70 93	0 20 65	20 60 90	0 15 60	10 55 87	— 0 45	— 35 80	— 0 15	— 15 75
Residue from distillation to 360°C (680°F) Volume percentage of sample by difference	50	—	55	—	67	—	75	—	80	—
Tests on residue from distillation: Penetration, 100 g. 5 sec. at 25°C (77°F) Ductility, 5 cm/cm., cm. (See Note 2) Solubility	120 100 99	250 — —	120 100 99	250 — —	120 100 99	250 — —	120 100 99	250 — —	120 100 99	250 — —
Spot test	Negative for MC-3000 only									

Note 1. As an alternate, Saybolt-Furol viscosities may be specified as follows:

Grade MC-70 - Furol viscosity at 50°C (122°F) - 60 to 120 sec.

Grade MC-30 - Furol viscosity at 25°C (77°F) - 75 to 150 sec.

Grade MC-250 - Furol viscosity at 60°C (140°F) - 125 to 250 sec.

Grade MC-800 - Furol viscosity at 82.2°C (180°F) - 100 to 200 sec.

Grade MC-3000 - Furol viscosity at 82.2°C (180°F) - 300 to 600 sec.

Note 2. If the ductility at 25°C (77°F) is less than 100, the material will be acceptable if its ductility at 15.5°C (60°F) is more than 100.

TABLE 702-6
SPECIFICATIONS FOR SLOW CURING LIQUID ASPHALTS

	SC-70		SC-250		SC-800		SC-3000	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Kinematic Viscosity at 60°C (140°F) (See Note 1) Centistokes	70	140	250	500	800	1600	3000	6000
Flash point (Cleveland, open-cup), degrees C (F)	66 (150)	—	79 (175)	—	93 (200)	—	107 (225)	—
Water, percent	—	0.5	—	0.5	—	0.5	—	0.5
Asphalt residue of 100 pen., percent by wt.	50	—	60	—	70	—	80	—
Distillation test: Total distillate to 360°C (680°F), percent by volume	10	30	4	20	2	12	—	5
Tests on residue from distillation: Kinematic Viscosity at 60°C (140°F), Centistokes	4	70	8	100	20	160	40	350
Ductility of 100 pen., residue at 25°C (77°F), 5 cm. per min., cm.	100	—	100	—	100	—	100	—
Solubility	99	—	99	—	99	—	99	—

Note 1. As an alternate, Saybolt-Furol viscosities may be specified as follows:

Grade SC-70 - Furol viscosity at 50°C (122°F) - 60 to 120 sec.

Grade SC-250 - Furol viscosity at 60°C (140°F) - 125 to 250 sec.

Grade SC-800 - Furol viscosity at 82.2°C (180°F) - 100 to 200 sec.

Grade SC-3000 - Furol viscosity at 82.2°C (180°F) - 300 to 600 sec.

TABLE 702-7
SPECIFICATIONS FOR HIGH FLOAT EMULSIONS

GRADE	HF-100		
	Min.		Max.
Tests on emulsions: Viscosity Saybolt Furol at 122°F (50°C) sec.	50		400
Storage stability 24 hr., %	—		1
Sieve test, %	—		0.1
Demulsibility, 50 ml. 5.55 g/L CaCl ₂ , % by mass	30		—
Distillation: Residue, %	65		—
Oil distillate, by volume of emulsion, %	—		2
Tests on residue from distillation test: Penetration 25°C (77°F), 100 g. 5 sec.	100		170
Ductility 25°C (77°F) 5 cm per min., cm	40		—
Solubility	95.5		—
Float Test 140°F, sec.	1200		—